

Math 1060 – Exam 4 Review

Perform the indicated operation and write the answer in the form $a + bi$, where a and b are real numbers.

1. $(2 + 7i) - (-4 + 2i)$ 2. $(4 - 3i)(2 + 8i)$ 3. $\frac{-5 + 2i}{1 - 3i}$

Evaluate the indicated power of i .

4. i^{29} 5. i^{76} 6. i^{34} 7. i^{23}

Find the product of the complex number and its conjugate.

8. $2 - 4i$

Write the expression in the form $a + bi$, where a and b are real numbers.

9. $\frac{12 + \sqrt{-36}}{3}$

Write the complex number in trigonometric form, using degree measure for the argument.

10. $-2\sqrt{3} + 2i$

Write the complex number in the form $a + bi$.

11. $9(\cos 240^\circ + i \sin 240^\circ)$

Perform the indicated operation. Write the answer in the form $a + bi$.

12. $4(\cos 60^\circ + i \sin 60^\circ) \cdot 3(\cos 150^\circ + i \sin 150^\circ)$ 13. $\frac{7(\cos \frac{5\pi}{6} + i \sin \frac{5\pi}{6})}{2(\cos \frac{\pi}{3} + i \sin \frac{\pi}{3})}$

Use De Moivre's Theorem to simplify the expression. Write the answer in $a + bi$ form.

14. $[2(\cos 225^\circ + i \sin 225^\circ)]^7$ 15. $(-4 + 4i\sqrt{3})^4$

Find the indicated roots. Write the answer in trigonometric form.

16. Fourth roots of $81(\cos 292^\circ + i \sin 292^\circ)$ 17. Fifth roots of $32i$

Solve the equation. Write the answer in $a + bi$ form.

18. $x^3 + 64 = 0$

Convert the rectangular coordinates to polar coordinates, using radian measure for the angle.

19. $(-5, -5)$ 20. $(-4, 0)$ 21. $(2\sqrt{3}, -2)$

Plot the point whose polar coordinates are given.

22. $(2, -\frac{2\pi}{3})$ 23. $(4, \frac{5\pi}{6})$ 24. $(-3, 210^\circ)$

Convert to rectangular coordinates.

25. $\left(-2, \frac{3\pi}{4}\right)$

26. $\left(3, -\frac{1}{2}\pi\right)$

27. $\left(-4, \frac{4\pi}{3}\right)$

Graph the polar equation.

28. $r = 7$

29. $r = -6\sin\theta$

30. $r = 3 - 3\cos\theta$

31. $r^2 = 4\sin(2\theta)$

32. $r = 3 + 6\sin\theta$

33. $r = 4\sin(3\theta)$

34. $r = 5 - 2\sin\theta$

35. $r = 5\cos(4\theta)$

For the given polar equation, write an equivalent rectangular equation.

36. $r = 7$

37. $r = 5\cos\theta$

38. $r = 7\csc\theta$

For the given rectangular equation, write an equivalent polar equation.

39. $x^2 + y^2 = 64$

40. $x = 5$

41. $x^2 + y^2 + 5y = 0$

Graph the pair of parametric equations in the rectangular coordinate system.

42. $x = -2t + 5, y = 4t; -1 \leq t \leq 2$

43. $x = 3t + 4, y = t^2 - 7; -4 \leq t \leq 4$

Eliminate the parameter of the pair of parametric equations.

44. $x = 8t, y = 4t + 9$

45. $x = t + 5, y = t^2 + 3$

46. $x = 4\cos\theta, y = \sin\theta$

Write a pair of parametric equations that will produce the indicated graph.

47. The line segment starting at $(1, -2)$ with $t = 0$ and ending at $(13, 1)$ with $t = 3$.

48. The line segment starting at $(2, 5)$ with $t = 3$ and ending at $(-10, 13)$ with $t = 7$.